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ABSTRACT

While college reading programs have lagged behind public school systems in the procurement of computers, a move toward using computers to provide at least part of the instruction in postsecondary reading programs seems to be gaining momentum. With the abundance of software on the market, lab personnel need a categorization scheme to use while reviewing and evaluating programs. Among such systems are seven types of programs pertinent to the needs of college reading instructors: (1) authoring systems/languages, (2) teacher aids/utilities, (3) database management systems, (4) word processing systems, (5) simulations/adventures, (6) computer assisted instruction, and (7) game programs. The organization of the curriculum should be considered before purchasing software, as should four generally accepted goals of instruction: success in college content classrooms, improved performance on reading tests, improved reading efficiency, and increased motivation to read. Finally, each college reading program will need to evaluate its needs before purchasing software, and evaluate each piece of software in terms of compatibility with existing hardware, instructional and technical quality, interactive capability, and flexibility. (A software evaluation sheet and a list of college reading and learning assistance technical reports are included.) (HTH)

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College Reading and Learning Assistance
Technical Report 86-05

Computers in the College Reading Program:
A Basic Primer

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Computers in the College Reading Program: A Basic Primer

Recent years have seen a proliferation of computers and computer software in public school systems across the nation. The computer, no longer the "wave of the future," is now a standard classroom fixture, along with the basal reader series, the chalkboard, and the globe. Consequently, teachers today often possess a degree of expertise in computer programming or some knowledge of computer software. During the formative years of computer-assisted instruction, quality software for teaching reading to school-age children was not readily available. But now, with increasing demand for quality, the tide is slowly turning. Software was originally conceived and developed by people with programming expertise but without pedagogical knowledge; now more educators and programmers work collectively to produce software that is sophisticated both technically and educationally (Covington, 1984). In addition, software can now encourage interaction between student and instructional content. Programmers, moving away from the "workbook on a screen" idea, are developing language-based approaches for teaching reading and encouraging students' creativity in response to text. As teachers continue to demand quality software, the industry, ever sensitive to market factors, will improve product quality.

The improvement of software is indeed encouraging news for teachers and students alike. Yet, the main focus of this improvement has been the elementary school curriculum, leaving a continued void at the other end of the instruction ladder. While college reading programs have lagged behind public school systems in the procurement of computers, a move toward using computers to provide at

least part of the instruction in postsecondary reading programs seems to be gaining momentum across the country. Educators involved in college reading may question what kind of software to purchase. How can we identify and purchase software that will be pertinent to students' academic needs and engage their interests? What types of software will promote the goals and enhance the effectiveness of instruction? It is the purpose of this paper to offer basic information and guidelines to college reading personnel who are faced with such questions.

Types of Software Programs

With an abundance of software on the market, lab personnel need a categorization scheme to use while they review and evaluate programs. Although other classification systems exist, the seven types of programs listed here seem to be pertinent to the needs of college reading instructors.

Authoring systems/languages

An authoring system is a program which allows the teacher to develop tests or lessons. It usually teaches the user a simplified language used to program the lessons, and then it guides the user through the process in a step-by-step manner. The tests or lessons are generally in a standardized format, but they allow the user a degree of flexibility in the type of format employed.

Teacher Aids/Utilities

A teacher aid/utility helps the instructor manage classwork in some way, either by acting as a record keeper or by being a test/lesson generator. While an aid/utility is similar to an authoring system, it is less flexible and does not require the user to learn a language. Also, the computer may do some calculation with the keyed-in material. For instance, a readability program in

which the teacher first types in a 100-word passage and then uses the program to calculate the readability level of the passage, might be considered a utility. A vocabulary program which allows the teacher to add lists of words to a basic corpus might be considered to have a teacher-aid component in it.

Data Base Management Systems

Data base programs allow the user to manage information. In such programs, teachers can keep files (for instance, individual prescriptions) on each student using a data base system.

Word Processing Systems

Word processing software allows users to compose, revise, edit, and print text. A word processor, unlike a typewriter, enables the writer to revise and edit text with ease. Text may be changed quickly, without tedious retyping.

Simulations/Adventures

A simulation program requires the user to take a role and to make decisions based upon the events presented on the screen. For example, the user in one program is asked to take the role of Huck Finn (Wresch, 1983) and extricate himself from Huck's various predicaments. An adventure is a simulation which is in the style of an adventure story.

Computer-Assisted Instruction (CAI)

CAI refers to programs which are instructional in content. Programs like Computer Assisted Study Skills Instruction (CASSI) (Georgia Institute of Technology, 1982) and Reading Comprehension Tutorcourse (Random House, 1982) are examples of comprehensive CAIs. These programs generally provide (1) a form of diagnostic testing, (2) a set of lessons presenting particular skills, (3) self-paced branching exercises for practicing skills, (4) post-test activities,

and (5) records of students' scores. Skill/drill programs can also be considered examples of computer-assisted instruction. But, while comprehensive CAIs emphasize tutorial instruction, the instruction in skill/drill programs may be less comprehensive and may focus more directly on practice exercises.

Game Programs

A game program does not emphasize direct instruction, but permits users to practice skills in an entertaining way. One example is "Hangman," a time-honored vocabulary/spelling game, which can be played on the computer.

Considerations in the Purchase of Software

Organization of Curriculum

Before purchasing software for the computer lab, consider the organization of your reading curriculum. Some college reading programs consist of only an individualized lab, some offer traditional courses, and others offer a combination of services. The population of students to be served also varies from school to school. If the lab serves as the only avenue of instruction for students, software should encompass the total array of college reading skills. If, however, computer lab assignments reinforce traditional coursework, choose supplemental lab materials. In such a situation, software should feature either teacher aid/utility programs or authoring systems that allow instructors to key in their own comprehension passages, vocabulary words, or other lessons. Rather than assigning one set of vocabulary words for classwork and another set in the lab, personnel may use crossword puzzle generators to develop activities based on vocabulary words featured in the course. Each week, for instance, different students can key in the clues and new words into the program. Or each student in the class could key in one or two words which need further study.

Instructional Goals

Four generally accepted goals of instruction should be considered when choosing computer software: (1) success in college content classrooms, (2) improved performance on reading tests, (3) improved reading efficiency, and (4) increased motivation to read. When lab personnel evaluate reading software, they should keep the instructional goals in mind; software that does not support the program's goals may be of questionable use in the curriculum and hence a questionable financial expense.

Success in College Content Classrooms

The holistic approaches to college reading instruction stress skills supportive of students' mastering content of the college curriculum. In some programs, for example, the requirement for passing a reading course is the mastery of full-length textbook chapters drawn from a lower division content course. Strategies and tactics for study, as well as skills for vocabulary development, are taught in relation to the chapters, not with short, unrelated passages. However, finding college level computer programs which have a strategy orientation and use content text is extremely difficult. Hence, lab personnel should purchase materials that can be adapted to specific needs (i.e., programs with teacher utility/authoring system capabilities). Even with such capabilities, most programs fall short of teaching interactive study or text-processing strategies. New college level software is being developed which appears promising for teaching the tactics of underlining, outlining, or mapping. Blanchard's (1985) system, for example, requires students to underline text presented on the screen. The program then generates cloze sentences from the underlined text for the student to use while studying. Recently, a limited number of other programs have appeared on the market (Rauch & Wogen, 1984). The

technology for producing software to teach study skills in an interactive fashion is here, but at the moment, lab personnel should preview existing material carefully and wait for better material to be placed on the market.

Available now are programs with spread sheets, such as Appleworks (Apple Computer Incorporated, 1983) and other data base management programs. With these programs, creative lab personnel can teach students study methods and organizational techniques (Mason, Blanchard, & Daniel, 1983). For instance, a simple program could direct students to list distinguishing characteristics or features of types of information under study. Say, for example, that the class has just read a psychology chapter which discusses certain types of psychoses. Each type of psychosis could be categorized by prevalence, severity, treatment, or prognosis. Once the information has been typed into the program, it can be accessed in a variety of ways. For instance, students might compare the severity of all the psychoses they are studying, or they might compare and contrast the treatment and prognosis of two particular psychoses. Encoded information can be printed for use in personal study guides.

Another content-field text-processing strategy taught by many reading/study skills instructors is test question generation. Students are asked to think of good test questions based upon the text they have just read, and to answer self-generated questions as a study strategy. An authoring system or teacher aid/utility could be used to help students make up a "practice test." Different students could contribute two or three questions. After taking the student-generated test, students obtain immediate feedback in terms of the correct answers and overall scores.

Another feasible alternative is an authoring system such as CAIWARE

(Microgнome, Fireside Computing, Inc., 1982), which allows teachers to make up instructional lessons. Additionally, students could generate their own "lessons" from text or study guides. By so doing they would learn to (1) recognize important information, (2) summarize information, and (3) organize and sequence information in a meaningful way.

Word-processing software, readily available to lab personnel, is useful not only in writing but in teaching text-processing strategies for content-field materials. With word processing, students can write text summaries or reactions to texts, or make up outlines or sets of notes. Because material can easily be inserted, teachers could supply students with the main idea from a text and then require students to supply significant details--or vice versa. As another example, students could be required to write a conclusion to a passage.

Although comprehensive study skills programs are available, text-study programs complementing basic coursework should be flexible and adaptive. In many ways the range of activities is limited only by the creativeness of the reading staff.

Improvement on Reading Tests

Many developmental studies programs require students to pass departmental competency tests before exiting to general content-field courses, and remedial services may be offered to students who fail state-wide reading competency tests. So, while success in college content courses is one goal of college reading, another important goal is student improvement on tests of reading ability.

Programs which provide students with practice in taking reading tests are available on the market. They offer students passages to read and require them to answer questions based on the passages. With such programs, students can see

immediately their correct answers and their overall scores. Desirable programs may (1) allow students to reread the passage before answering a question, (2) monitor student performance on each question type (main idea, vocabulary, etc.), (3) permit students to reread and reanswer missed questions, (4) provide explanations as to why answers are right or wrong--SAT preparation programs do this (Hayden Software Co., 1984), and (5) permit teachers to add their own passages and questions. Current technology can certainly produce testtaking improvement programs with these advantageous features. In fact, lab personnel with only rudimentary programming knowledge can design programs with these features if given release time to do so (Mason, Hynd, Prince, & Layton, 1984).

Improvement in Reading Efficiency

Another goal of many college reading programs is the improvement of reading efficiency. Computers can mimic all of the activities associated with reading apparatus from the mechanized era of instruction (e.g., controlled readers, tachistoscopes, or accelerators). Unfortunately, much of the speed reading software is based upon the faulty premises inherent in the use of such devices. The transfer of reading rate from mechanized programs to real text has not been the general rule over the years. Hence, lab personnel should evaluate material carefully and choose flexible programs which permit the use of lessons that are compatible with comprehension instruction research and which allow the deletion of lessons merely based on tradition.

Increase in Motivation

A final goal of college reading instruction is motivation. If students are to become better readers, they must be provided with activities that will motivate them to read. Computers, which provide both a novelty effect and

positive reinforcement, are inherently motivating. Some programs actually enhance students' enjoyment of reading.

The simulation category of program actively promotes the enjoyment of reading. The Plato system (1974) includes programs in business and science that engage students in planning and implementing an event. Students may be required to act as supervisors, employees, union officials, or government agents. They are presented with a number of crises and asked to respond; then their responses are evaluated. Other simulations exist for other professional groups.

Another mode stresses interactive fiction. One program, The Dragons of Hong-Kong (Adventure International, 1984), places the student in the role of the main character of a spy/intrigue story. The student must make decisions which may entail getting killed, finding missing clues, or moving forward in the search.

Another type of program with motivational value asks questions in a multiple-choice format about classic pieces of literature. Although this format may not seem motivational at first glance, the instructional sequence for using the software may foster positive attitudes toward reading. Students, required to read a piece of literature for class, come to the lab in groups and go through a program keyed to the literature. As they encounter each question, they surmise the correct answer and justify the answer. Of course, they can use the novel, class notes, or even critical commentaries as references. Thus, they are motivated to discuss the text in a way that might not be fostered in a large group. Teachers can monitor students' understanding of aspects of the text by simply accessing their responses. Any points that were misunderstood can be discussed in class. The programs, then, require students to employ critical

thinking in relation to text. In addition, the interactive appeal of these programs may encourage otherwise unmotivated students to read for longer durations of time.

Teacher Effectiveness

A final goal for instruction is the improvement of one's own effectiveness as an instructor of developmental reading. Monitoring student performance records is enhanced. Existent are gradekeeper programs which store grades, average grades, and provide statistical information (e.g., means, standard deviations). Additionally, teachers can actually talk to students through the computer. It is possible to network computers in a lab so that they are all capable of communicating with one another or with a main computer. Labs can be set up with one hard disk drive permitting the lab instructor to load a program which can be seen on all the computer screens. Hence, the teacher can access any student's computer and provide him or her with an appropriate instructional message. The student can then respond back to the teacher. The Plato (1974) system has this capability.

Instructors can also use the computer to communicate with other professionals with similar interests across the nation via electronic mail. A project funded by an Exxon grant, for instance, enables college instructors to share ideas concerning the use of computers in their writing classes via electronic mail (G. E. Mason, personal communication, May 23, 1985).

Finally, teachers, like students, can employ authoring systems and test generators. Question files can be developed and accessed randomly to produce original tests; later, these test can be scored by computer. Moreover, word

processing programs will enable teachers to write, store, and revise syllabi, assignments, and notes for students.

Conclusion

Keeping current with the burgeoning array of software programs is indeed a formidable task. Nevertheless, through software directories (Mason et al., 1983) and educational software distributors, college personnel can stay abreast of new software. But each college reading program will need to evaluate its needs before deciding which software to purchase. Careful evaluation of each piece of software in terms of its content and quality is necessary. Here, four criteria should be considered: (1) ability to interface with existing hardware, (2) instructional and technical quality, (3) interactive capability, and (4) flexibility. The short evaluation form in Figure 1 should assist with this evaluation process.

Insert Figure 1 about here

Until college level computer courseware improves in the first two areas, instructors may need to rely on flexible programs and on their own creative solutions to instructional problems.

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Figure 1

Software Evaluation

Program_____ Overall Rating (A-F)_____
Computer_____ Reviewer_____
Publisher_____ Levels: Grades_____ Ages_____
Price_____ Subject_____

Type: AS TU DB WP S CAI G

Description:

Use Y, N, or NA

I. Instructional Goals
_____ 1. The program could be used to improve reading.
_____ 2. The content has educational value.
_____ 3. The materials have identified goals and objectives.
_____ 4. The documentation provides teaching strategies.
_____ 5. Content presentation and format is appropriate for college level application.

II. Instructional Quality
_____ 1. The package's purposes are well-defined and permit thorough treatment.
_____ 2. Presentation of the print on the screen is legible.
_____ 3. Cues and prompts help students answer questions correctly.
_____ 4. Graphics/color/sound are used appropriately.
_____ 5. Feedback is effective and appropriate.
_____ 6. The learner controls the rate and sequence of presentation and review.

III. Technical Quality
_____ 1. The user support material is clear and complete.
_____ 2. Texts and/or workbooks accompanying the program are well written.
_____ 3. Users can easily and independently operate the program.
_____ 4. Teachers can modify the program.
_____ 5. Program makes use of the computer's capabilities (not just a workbook).
_____ 6. The program is free of errors.
_____ 7. Record-keeping is possible.
_____ 8. The user may easily return to the menu.

*This evaluation form was adopted from one developed by George E. Mason, University of Georgia.

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